

## B737NG Alerting Issues – Lateral track or vertical path deviation beyond limits

**1. Initiating Condition:** In RNP approach and similar Next-Gen terminal area operations, the aircraft's failure to follow the centerline of the lateral track and/or vertical path within the required deviation limits (e.g., RNP value for lateral track), due to excess wind, autopilot failure, failure to engage autopilot/mode, or specific FMS/autopilot inability to meet specs

Type	Alert or cue	Threshold for alert or cue to be presented	Confusion regarding alert or cue	Other issues with regard to alert or cue	When alert is inhibited/suppressed or when cue is masked	How alert or cue is terminated
<b>Visual Alerts</b>	PFD/EADI Navigation Performance Scales/ANP Bars (flash first 10 seconds of exceedence, turn amber if exceeded 10 seconds) (if installed)	Track deviation exceeds RNP as adjusted for ANP. RNP limit for the aircraft, crew, and specific approach is manually entered by the pilots	Possible confusion between ANP, RNP, and deviation indications on the Navigation Performance Scale	Unless the NPS are installed, there is no alert for excessive crosstrack error.		Track restored within limits
<b>Aural Alerts</b>	None					
<b>Tactile Alerts</b>	None					
<b>Visual Cues</b>	On the FMS CDU Progress Page 4, the crosstrack error value on exceeds RNP value	RNP limit for the aircraft, crew, and specific approach		These cues require scanning (including obtaining the proper CDU page and incorporating that display into the instrument scan, which is unusual; and interpretation		
	On the ND, the lateral path deviation value is displayed (in tenths of NM, with "L" or "R") immediately below the airplane symbol (if installed)		This value requires scanning, interpretation, and comparison with the appropriate track deviation limit	If this feature is not installed, the lateral track deviation value is only available on the FMS CDU Progress Page 4.		

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Visual Cues	On the ND, the aircraft symbol deviates from the magenta line (lateral deviation); and/or the PDI deviates from the center of the path deviation scale (vertical deviation)	RNP limit for the aircraft, crew, and specific approach	Detecting lateral track deviation from the aircraft symbol/magenta line display is ambiguous because display of the deviation depends on the range setting on the EHSI/ND display; Detecting vertical path exceedence is ambiguous because the PDI is a 400 foot scale and the deviation limit is neither shown nor would appear to be a large deviation on the scale.			
Aural Cues	None					
Tactile/Somatic Cues	None					

#### **Expected Pilot Response(s)**

- If not in visual contact with the runway, execute a missed approach.
- Hand fly lateral path during missed approach to within RNP limits (including RF leg) until automation can be re-engaged (1000 feet for 737).

#### **Possible sources of confusion with regard to pilot response(s)**

- The precise condition of exceeding the required limits is not saliently alerted without the navigation performance scales).

#### **How does pilot know condition is resolved/recovered?**

- Flight path is recovered to within limits, as displayed on EHSI/ND and CDU Progress Page crosstrack error text display.

#### **Issues with regard to multiple concurrent non-normal conditions**

- Aircraft making a missed approach in response to this condition may complicate NextGen automated sequencing/metering or traffic separation.